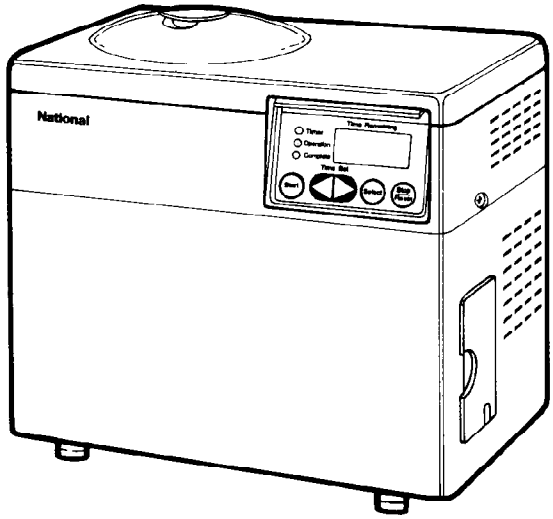
ORDER NO. KAD87110154C3

Service Manual

Automatic Bread Maker

SD-BT2N



Specifications

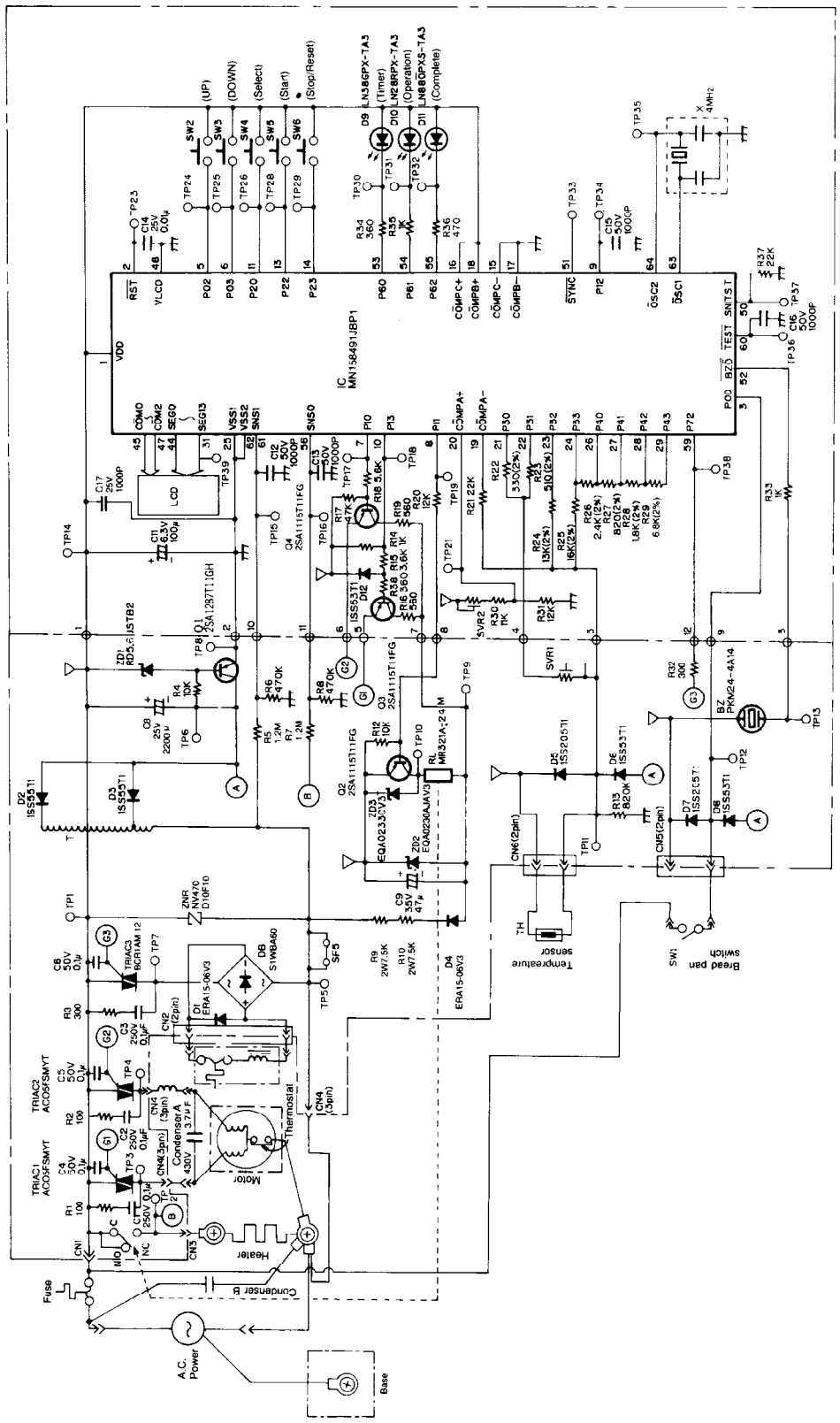
Power Source	Local supply, 50 / 60Hz
Power Consumptions	Heater — 410W, Motor — 100 / 110W
Kneading Blade Speed	50Hz — 260r.p.m, 60Hz — 320r.p.m.
Bread Flour Capacity	Min.150g — Max.300g
Operation Time	Bread — 4 hours, Dough — 1 hour 55 minutes
Timer	4 hour 10 minutes~13 hour (digital)
Protective device	Self-ressetting motor protector
Dimensions (H×W×D)	32.5×35.0×24.0cm
Weight	7.7kg
Accessories	Measuring cup, Measuring spoon (15mℓ and 5mℓ)

• Specifications are subject to change without notice.

National

Matsushita Electric Trading Co., Ltd.
P.O. Box 288, Central Osaka Japan

SCHEMATIC DIAGRAM:

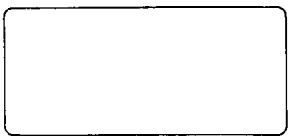
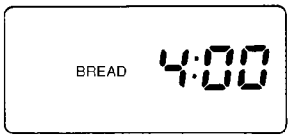
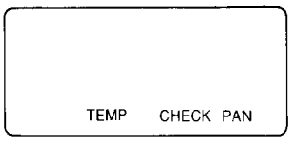
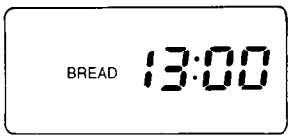
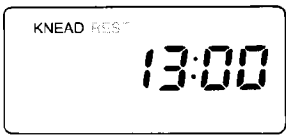
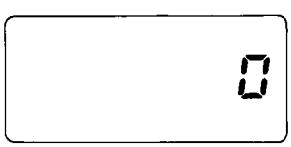


1. In the above circuit diagram, resistances are indicated as follows.
   a) Units
      No indication : Ω
      K: kΩ
      No indication: 1/4 W
      No indication: ±5%

2. In the above circuit diagram, cepacitors are indicated as follows.
   a) Units
      P: pF
      μ: μF

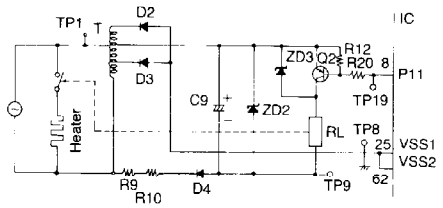
LCD INDICATIONS DURING EACH MODE

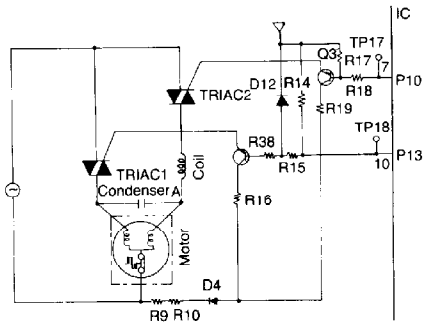
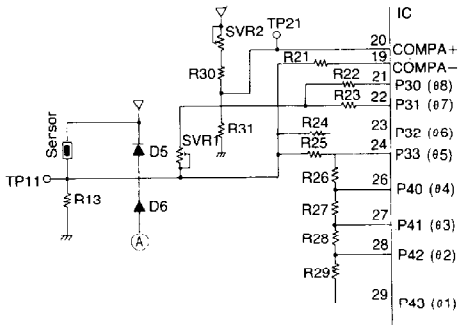
■ **LCD indications during each mode**

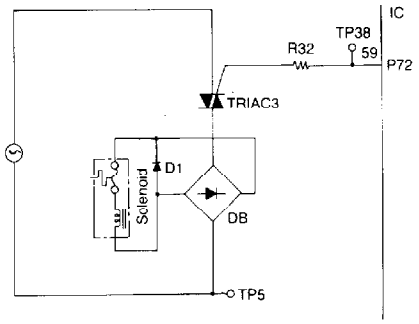
MODE	LCD INDICATION	
Initial		• This indication will usually appear when the power cord is plugged into an electrical outlet.
Reset		• No indication.
Standby		• If the (Setting) button is pressed once during either the initial mode or the reset mode, "BREAD" and "4:00" will appear in the display. If the button is pressed again, the display will change to "DOUGH" and "1:55".
Start inhibit		• The Timer, Operation, and Complete lamps will repeatedly flash on and off in that order. At the same time, the buzzer will sound eight times (0.1 second each time). • Depending on the cause, either "TEMP" or "CHECK PAN" will appear in the display.
Timer setting		• If the (◀) button is pressed once during either the initial mode or the reset mode, "13:00" will appear in the display. If the (▶) button is pressed once, "4:10" will appear. • The time will change up or down in ten-minute units each time either of these buttons is pressed.
Timer		• The Timer lamp (green) will light up. The time will be counted down in one-minute units.
Operation		• The Operation lamp (red) will light up. In accordance with the progress of operation, "KNEAD", "RISE", and "BAKE" will appear in the display. The time will be counted down in one-minute units.
Complete		• The Complete lamp (orange) will light up. The buzzer will sound eight times (0.3 second each), and the display will go out.

CIRCUIT DESCRIPTIONS

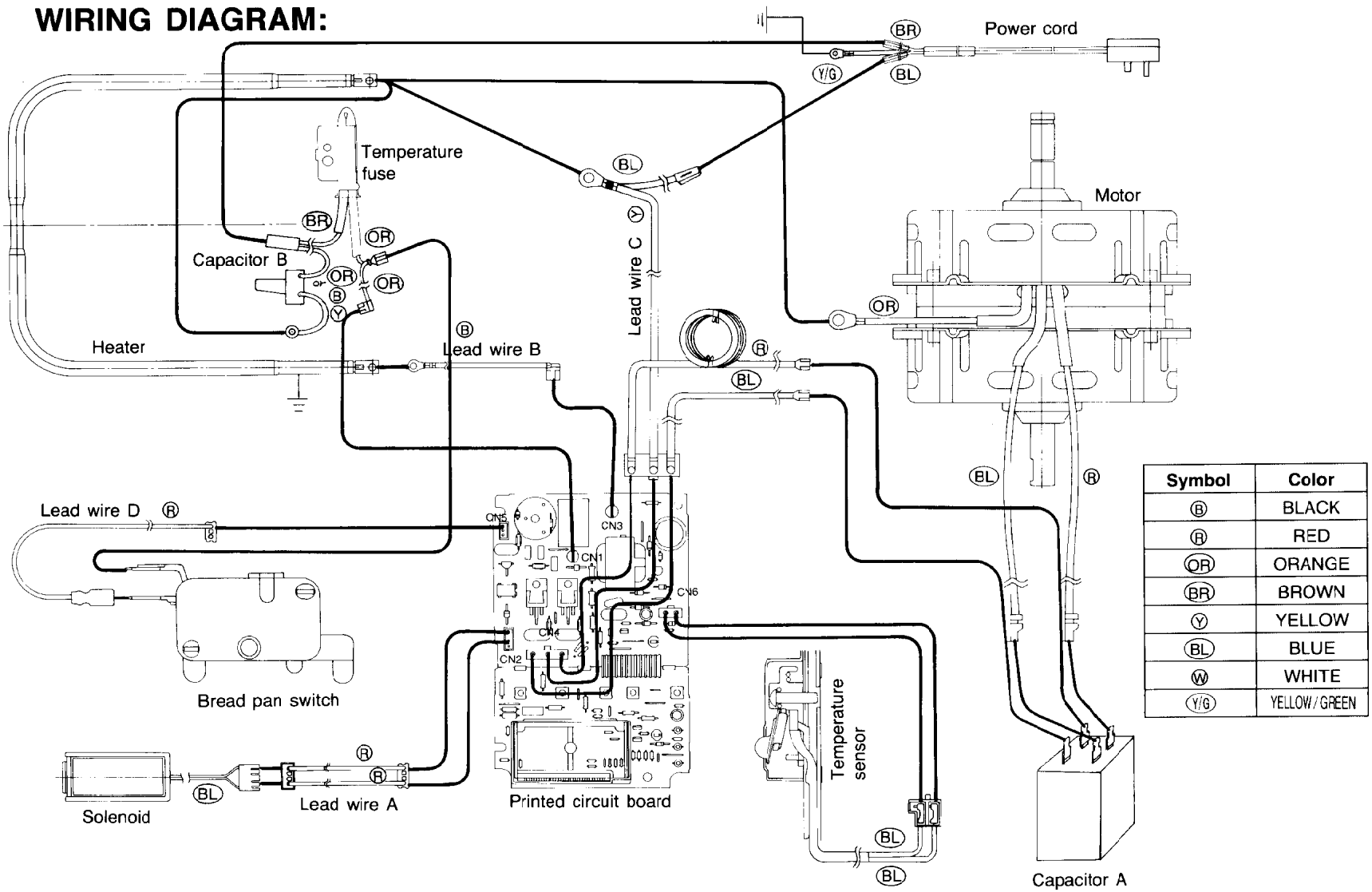
■ **Circuit descriptions**

Procedure	Operation	Circuit
Connection of power cord	The power supply circuit functions and the AC and DC voltage are supplied to the various circuits.	• Low-voltage transformer • Power supply circuit
	◊ 4 MHz is oscillated by the oscillator (X) connected to terminals (63) and (64) of the IC. (For the microcomputer)	• Oscillation circuit
	◊ The 0-volt pulse circuit (R5, R6, and C12) functions and a pulse synchronized to the power supply frequency is input to terminal (61) (0-volt pulse input terminal) of the IC.	• 0-volt pulse circuit
Input from the control buttons	When the buttons are pressed, the signals are input to terminals (5), (6), (11), (13), and (14) (switch input terminals) of the IC.	• Control section (switch circuits)
Input from the pan switch	When the pan is placed inside the body, the pan switch (SW1) switches ON, and approximately 5 VDC is applied to terminal (3) (pan input terminal) of the IC. HIGH level (approx. 5 V) → pan inserted LOW level (approx. 0 V) → pan not inserted	
Indications on the LCD	In accordance with the signals output from terminals (45)~(47) (common terminals) of the IC, the signals output from terminals (31)~(44) (segment terminals) of the IC are applied to the segments of the LCD to be indicated, and those segments light up.	• Display circuit
Relay operation	The relay signal is output from terminal (6) of the IC and the relay (RL) is operated via Q2. HIGH level (approx. 5 V) → relay (RL) is OFF LOW level (approx. 0 V) → relay (RL) is ON 	• Relay drive circuit
Buzzer signal	The buzzer signal is output from terminal (52) of the IC when a button is pressed, etc., and the buzzer is sounded via R33.	

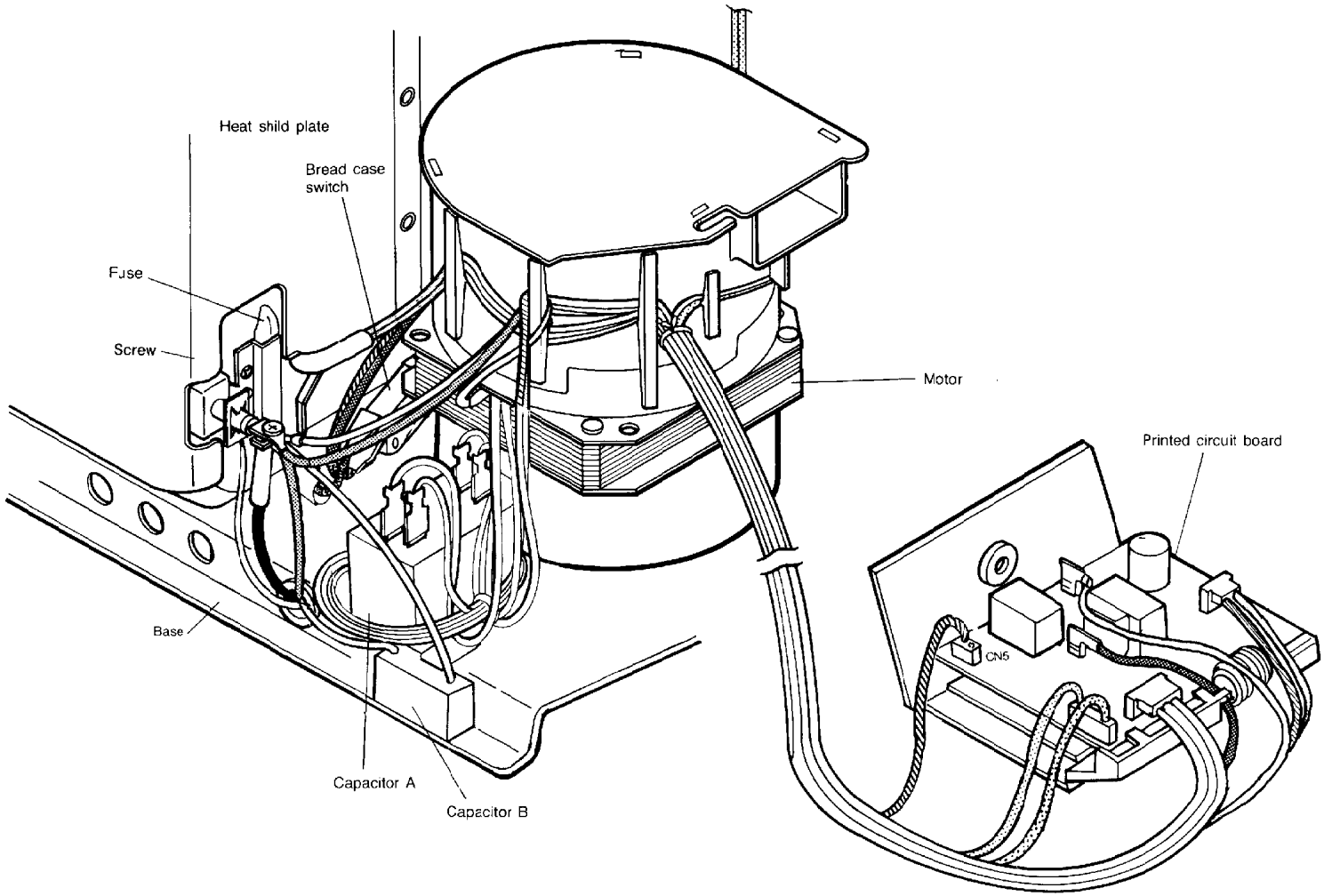
<table>
<tr><th>Procedure</th><th>Operation</th><th>Circuit</th></tr>
<tr><td>Triac operation
TRIAC 1
TRIAC 2</td><td>The triac 1 signal is output from terminal (10) of the IC, and the signal is applied to the gatls of triac 1 (TRIAC 1) via R15, R38, and Q3. The triac 2 signal is output from terminal (7) of the IC, and the signal is applied to the gates of triac 2 (TRIAC 2) via R18.
<table>
<tr><th>IC terminal ⑩
(Triac 1 signal)</th><th>IC terminal ⑦
(Triac 2 signal)</th><th>Motor status</th></tr>
<tr><td>HIGH level
(approx. 5 V)</td><td>LOW level
(approx. 0 V)</td><td>Forward (clockwise) revolution</td></tr>
<tr><td>LOW level
(approx. 0 V)</td><td>HIGH level
(approx. 5 V)</td><td>Reverse (counterclockwise) revolution</td></tr>
</table>

</td><td></td></tr>
<tr><td>Input of the temperature signals</td><td>The signals are input to terminals (19) and (20) of the IC in order to compare the reference voltage with the voltages corresponding to the temperatures determined by the sensor and the various resistors.

</td><td>• Temperature detection circuit</td></tr>
</table>

Procedure	Operation	Circuit
Adding of the yeast	The triac 3 signal is output from terminal (59) of the IC and applied to the gates of triac 3 (TRIAC3). The application of the signal to the gates of triac 3 (TRIAC3) causes current to flow to the solenoid, the yeast dispensing chute functions, and the yeast is added to the bread case. HIGH level (approx. 5 V) → does not function LOW level (approx. 0 V) → functions 	

WIRING DIAGRAM:



Symbol	Color
Ⓑ	BLACK
Ⓡ	RED
OR	ORANGE
BR	BROWN
Ⓨ	YELLOW
BL	BLUE
Ⓦ	WHITE
Y/G	YELLOW/GREEN


Heat shild plate
Bread case switch
Fuse
Screw
Motor
Printed circuit board
CN5
Base
Capacitor A
Capacitor B

DESCRIPTION OF OPERATING SEQUENCE

• **Before setting the test mode, disconnect the power for at least one minute.**

Indicator Quick Check Test Procedure Mode 1

Operation procedure

While simultaneously pressing all three Select, ▶, and Reset buttons, plug the power cord into an electrical outlet.

—	LED and LCD indications		Indication time
In the BREAD setting	● Timer ○ Operation ○ Complete	KNEAD BREAD 13:00	2 sec.
	*Note: During actual operation, the Timer lamp will light up. ○ Timer ● Operation ○ Complete	REST BREAD 12:00	2 sec.
	○ Timer ● Operation ○ Complete	KNEAD BREAD 3:30	2 sec.
	○ Timer ● Operation ○ Complete	RISE BREAD 3:00	2 sec.
	○ Timer ● Operation ○ Complete	BAKE BREAD 45	2 sec.
	○ Timer ○ Operation ● Complete		2 sec.
In the DOUGH setting	○ Timer ● Operation ○ Complete	KNEAD DOUGH 1:55	2 sec.
	○ Timer ● Operation ○ Complete	RISE DOUGH 1:15	2 sec.
	○ Timer ○ Operation ● Complete		2 sec.

* The BREAD and DOUGH settings will alternate repeatedly.
* The motor, heater, solenoids, and bread case switch will not function.

Cancel procedure Unplug the power cord from the electrical outlet for at least one minute.

Function Quick Check Test Procedure Mode 2

Operation procedure

While simultaneously pressing all three of the Select,Start, and Reset buttons, plug the power cord into an electrical outlet.

① While the buttons are being pressed, all segments of the LCD will light up. When the buttons are released, the initial mode will be indicated ("0:00").

② **BREAD setting** — To start immediately: Press the Start button.
To use the timer: Set the timer and then press the Start button.

DOUGH setting — Press the select button twice and then press the Start button.

LED and LCD indications

When starting immediately

○ Timer ● Operation ○ Complete	KNEAD BREAD	4:00
○ Timer ● Operation ○ Complete	KNEAD BREAD	3:30
○ Timer ● Operation ○ Complete	BREAD RISE	3:20
	BREAD RISE	2:25
	BREAD RISE	2:06
	BREAD RISE	2:05
	BREAD RISE	1:46
	BREAD RISE	1:45
○ Timer ● Operation ○ Complete	BREAD BAKE	45
○ Timer ○ Operation ● Complete		0
○ Timer ○ Operation ● Complete		

When using the timer

● Timer ○ Operation ○ Complete	KNEAD BREAD	13:00
● Timer ○ Operation ○ Complete	The time will be counted down at a rate of approximately one second for each hour	
○ Timer ● Operation ○ Complete	KNEAD BREAD	3:30
○ Timer ● Operation ○ Complete	BREAD RISE	3:20
	BREAD RISE	2:25
	BREAD RISE	2:06
	BREAD RISE	2:05
	BREAD RISE	1:46
	BREAD RISE	1:45
○ Timer ● Operation ○ Complete	BREAD BAKE	45
○ Timer ○ Operation ● Complete		0
○ Timer ○ Operation ● Complete		

For the DOUGH setting

○ Timer ● Operation ○ Compete	KNEAD DOUGH	1:55
○ Timer ● Operation ○ Complete	KNEAD DOUGH	1:25
	DOUGH RISE	1:15
	DOUGH RISE	20
○ Timer ● Operation ○ Complete	DOUGH RISE	1
○ Timer ○ Operation ● Complete		0
○ Timer ○ Operation ● Complete		

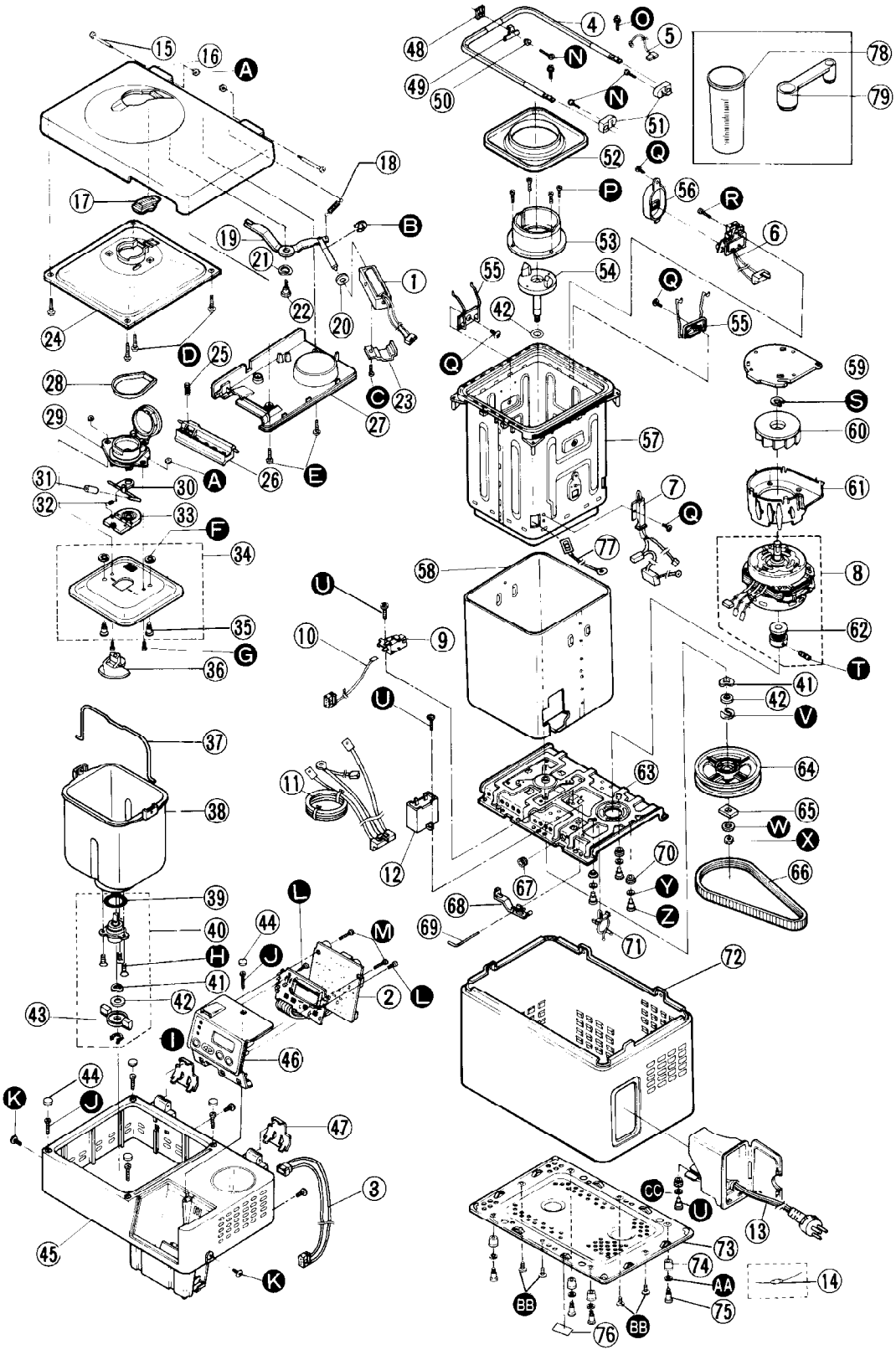
Operation of the motor and solenoids

(1)	Pre-kneading	10 sec.
(2)	Resting In accordance with the timer setting, 1 hr. = approx. 1 sec. (0 sec. for immediate start)	
(3)	Yeast introduction	1 sec. (1 time)
(4)	Kneading	5 sec.
(5)	First rising	5 sec.
(6)	First gas release 10 forward revolutions (at 0.2 sec. on + 0.4 sec. off each) = 6 sec.	
(7)	Second rising	5 sec.
(8)	Second gas release 10 forward revolutions (at 0.2 sec. on + 0.4 sec. off each) = 6 sec.	
(9)	Third rising	5 sec.
(10)	Third gas release 10 forward revolutions (at 0.2 sec. on + 0.4 sec. off each) + 1 sec. rest + 2 reverse revolutions (at 0.5 sec. on + 1 sec. off each) =10 sec.	
(11)	Rising and shaping	10 sec.
(12)	Baking	10 sec.
(13)	Buzzer	8 sec. (8 times)
(14)	Completion	5 sec.
		(Total 86 sec. + time set on timer)

- Steps (9)~(12) are omitted for the DOUGH setting.
- The heater will not function.
- The TEMP and CHEK PAN start failure are valid when starting.
- The bread pan switch is valid during operation.
- The time indications shown here are the times for the start of the process for low-temperature processing.
- When operation is completed the mode will revert back to (no indications).

Cancel procedure: Unplug the power cord from the electrical outlet for at least one minute.

EXPLODED VIEW



REPLACEMENT PARTS LIST

Ref. No.		Part No.	Part Co.	Part Name & Description	Pcs/Set	Remarks
1	⚠	ASD522H104-K	003 454 0692 0	Solenoid	1	220-230V
2	⚠	ASD250H104	003 485 2693 8	Printed circuit board Ass'y	1	220-230V
3	⚠	ASD241U103	003 496 4522 7	Lead wire A	1	
4	⚠	ASD420V103	002 363 1291 3	Heater	1	220-240V
5	⚠	ASD242U103	003 496 4523 6	Lead wire B	1	
6	⚠	ASD350U103-K	001 191 1034 2	Sensor	1	220-230V
7	⚠	ASD300H104	002 381 0721 4	Fuse	1	220-240V
8	⚠	ASD550V103	002 311 5290 8	Motor	1	
9	⚠	ASD221U103	003 438 1415 7	Bread pan switch	1	
10	⚠	ASD244U103	003 496 4525 4	Lead wire D	1	
11	⚠	ASD243U103	003 496 4524 5	Lead wire C	1	
12	⚠	ASD559V103	001 101 1059 7	Capacitor A	1	220-240V
13	⚠	ASD59WH104	003 490 5683 7	Power cord Ass'y	1	B-3P
14	⚠	SP5-5A	002 380 1221 0	Current fuse	(1)	Replacement Fuse for Circuit Board fusable link
15		ASD865-100-W	031 824 0014 1	Hinge bolt	2	
16		ASD12WU103-K	031 801 0120 7	Top lid	1	
17		ASD17D-100-K	031 652 0169 9	Steam vent	1	
18		ASD850-100-W	031 726 0084 4	Spring A	1	
19		ASD523-100	031 650 0136 8	Solenoid lever	1	
20		ASD526-100	031 653 0130 9	Rubber washer	1	
21		ASD878-100	031 650 0137 7	Washer A	1	
22		ASD524-100-W	031 650 0138 6	Solenoid lever screw	1	
23		ASD525-100-W	031 630 0102 0	Solenoid holder	1	
24		ASD829-100	031 650 0139 5	Lid bottom	1	
25		ASD851-100-W	031 726 0085 3	Lid lever spring	1	
26		ASD13D-100-K	031 652 0171 5	Lid lever	1	
27		ASD16W-100-K	031 652 0173 3	Lid cover	1	
28		ASD198-100-K	031 653 0131 8	Yeast dispenser rubber	1	
29		ASD84DU103	031 870 0308 0	Yeast dispenser	1	
30		ASD849-100	031 650 0140 2	Yeast dispenser chute	1	
31		ASD836-100-K	031 653 0132 7	Rubber cushion	1	
32		ASD852-100-W	031 726 0086 2	Spring C	1	
33		ASD846-100-K	031 652 0174 2	Yeast dispenser support	1	
34		ASD831U103-K	031 640 0098 3	Inner lid	1	
35		ASD835-100-W	031 931 0012 5	Inner lid screw	2	
36		ASD180-100	031 652 0175 1	Kneading blade	1	
37		ASD113-100-W	031 826 0030 1	Handle	1	
38		ASD111U103-F	031 870 0309 9	Bread pan	1	
39		ASD191U103-K	031 653 0138 1	Packing	1	
40		ASD930U103	031 757 0069 0	Mounting shaft unit	1	
41		AMX13B-451	031 643 0083 5	Wave washer	2	
42		AMX28H-L50	031 643 0123 4	Washer	3	
43		ASD863-100AW	031 760 0075 1	Connector upper	1	
44		ASD156-100-K	031 653 0133 6	Cap	5	

Ref. No.		Part No.	Part Co.	Part Name & Description	Pcs/Set	Remarks
45		ASD14W-100	031 802 0437 4	Upper housing	1	
46		ASD21WH104	031 840 0227 8	Control panel	1	
47		ASD86W-100	031 845 0081 3	Hinge cover	2	
48		ASD451-100-K	031 600 0045 0	Heater bobbin A	1	
49		ASD454-100-W	031 650 0141 1	Heater support plate	1	
50		ASD453-100 K	031 600 0046 9	Heater bobbin C	1	
51		ASD452-100-K	031 600 0047 8	Heater bobbin B	2	
52		ASD823U103-W	031 872 0018 7	Crumb tray	1	
53		ASD822-100-A	031 827 0147 4	Heater case base	1	
54		ASD860-100	031 760 0072 4	Connector lower	1	
55		ASD821-100	031 650 0146 6	Bread pan guide	2	
56		ASD354-100-W	031 640 0090 1	Sensor cover	1	
57		ASD811-100	031 650 0142 0	Heater case Ass'y	1	
58		ASD819-100	031 611 0015 5	Heat shild plate	1	
59		ASD544-100-K	031 652 0179 7	Fan guide cover	1	
60		ASD555-100-K	007 570 1888 5	Fan	1	
61		ASD554-100-K	007 561 1280 2	Fan guide	1	
62		ASD151-100-W	031 741 0046 3	Pully A	1	
63		ASD562V103	031 632 0041 6	Base	1	
64		ASD152-100-K	031 741 0047 2	Pully B	1	
65		ASD867-100-W	031 650 0143 9	Lock washer	1	
66		ASD158-100	031 752 0022 0	Belt	1	
67		ASR189-440-K	020 641 0004 7	Rubber bushing	1	
68		ASD232-100-W	031 650 0144 8	Bread pan switch lever	1	
69		ASD233-100-W	031 650 0145 7	Pin	1	
70		ASD579-100-K	031 653 0135 4	Motor cushion rubber	3	
71		ASD292-100-K	031 645 0035 3	Lead wire holder	1	
72		ASD10WH104-T	031 800 0619 0	Body	1	
73		ASD106-100-W	031 802 0438 3	Bottom plate	1	
74		ASD108-100-K	031 828 0026 7	Rubber foot	4	
75		ASD105-100-Z	031 931 0013 4	Screw	4	
76		ASD600H104	031 631 0208 4	Ratiing plate	1	
77	⚠	ASD595V103	031 934 0041 5	Ground wire B	1	
78		ASD917U103-K	031 901 0020 3	Measuring cup	1	
79		ASD911U103-K	031 901 0021 2	Measuring spoon	1	
D9	⚠	LN38GPX-TA3	001 035 0212 9	Diode	1	(Red)
D10	⚠	LN28RPX-TA3	001 035 0211 0	Diode	1	(Green)
D11	⚠	LN88OPXS-TA3	001 035 0215 6	Diode	1	(Orange)
LCD	⚠	EDD063C90A3P	001 080 0447 7	LCD	1	
SW2-6	⚠	EVQQKC05B	003 437 0706 8	Tact switch	5	
TR1,2	⚠	AC05FSMYT	001 034 0327 4	Triac	2	TRIAC 1,TRIAC 2
TR3	⚠	BCR1AM-12	001 034 0328 3	Triac 3	1	TRIAC 3
T	⚠	ETP-28Y190AY	001 200 5686 8	Trance	1	
ZNR	⚠	NV470D10F10	001 192 0426 9	Surge absorbers	1	
BZ	⚠	PKM24-4A14	002 340 0155 1	Buzzer	1	
RL	⚠	MR321A-24M	003 450 2684 2	Relay	1	
DB	⚠	S1WBA60	001 032 5966 9	Bridge diode	1	

Ref. No.		Part No.	Part Co.	Part Name & Description	Pcs/Set	Remarks
A	Ⓢ	XNG3EVWS		Nut	4	
B	Ⓢ	XUC6FT		E-crip	1	
C		ASD936U103		Screw	1	
D		XTT4+14BUR		Screw	4	
E		ASD937U103		Screw	2	
F		ASD882-100-K		Push nut	2	
G		ASD847-100-W		Screw	2	
H		ASD934U103		Screw	3	
I		XUB8V		C-crip	1	
J		ASD876-100-C		Screw	5	
K		ASD858-100-C		Screw	4	
L		XTN4+8G		Screw	2	
M		XTB4+12B		Screw	2	
N		ASD855-100-H		Screw	3	
O		XYM35+C10U		Screw	2	
P		XTB4+10HX		Screw	4	
Q		ASD854-100-H		Screw	4	
R		ASD857-100-H		Screw	1	
S	Ⓢ	XUB10FT		C-crip	1	
T		XXE5D6FP		Screw	1	
U		ASD872-100-Z		Screw	3	
V	Ⓢ	XUE6FT		U-crip	1	
W		XWG5E10		Washer	1	
X		ASD873-100-Z		Nut	1	
Y		XWG6F13		Washer	3	
Z		ASD571-100-Z		Screw	3	
AA		XWE6E115		Washer	4	
BB		ASD881-100-Z		Screw	4	
CC	Ⓢ	XWA4BVW		Washer	1	
		ASD770H104-X	031 983 0388 6	Operation Instructions	1	
		ASD773H104-X	031 983 0389 5	Menu Book	1	
		ASD72WH104-X	031 971 0807 4	Indivdual carton	1	
		ASD750-100	031 977 0155 7	Carton filler	1	